

PREVALENCE OF DENTAL ANOMALIES IN PATIENTS
WITH CLEFT LIP AND PALATE

ABSTRACT

Background: Cleft lip and palate is among the most common congenital human malformations. When compared with the general population, subjects with a cleft lip and palate have been found to have a higher prevalence of dental anomalies.

Aims: The purpose of the following study is to investigate the frequency of various dental anomalies in patients with unilateral and bilateral cleft lip and palate, both inside and outside the cleft region, and the possible association between the side of the cleft and the side of the dental anomalies.

Materials and method: 100 patients with cleft lip and palate with age ranging from 8 to 25 years were included in the study. Diagnostic records, including orthopantomograms, lateral cephalograms, dental casts and photographs were evaluated for the prevalence rates of three different dental anomalies i.e. missing, impacted and supernumerary teeth for each group.

Results: A significantly high proportion of subjects were having at least one dental anomaly with the most prevalent being missing maxillary lateral incisors in the cleft region. Missing, impacted as well as supernumerary teeth were significantly higher in the cleft side of unilateral cleft lip and palate patients. In bilateral cleft lip and palate patients missing and supernumerary teeth were higher on both sides of the defect whereas impacted occurred only on one side of the defect.

Conclusion: Thus, the management of dental anomalies should be central to the treatment planning process of individuals with a cleft.

Keywords: cleft, lip, anomalies, orthodontics

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INTRODUCTION

Cleft lip and palate (CLP) is among the most common congenital human malformations. Failure of fusion of the maxillary and medial nasal prominences or between the palatal processes results in clefts of varying extent, unilaterally or bilaterally.¹ It affects between 1 and 7 of 1000 newborns with higher frequency in Asian people.^{2,3} Compared to general population, CLP subjects have a higher prevalence of dental anomalies, such as variation in tooth number and position and reduced tooth dimensions, most of which is localised in cleft area.⁴ Akcam et al⁵ investigated the frequency of various dental anomalies in the maxillary

dental arch in various cleft groups and found that a significant proportion (96.7%) of subjects with the cleft had at least one dental anomaly. Shapira et al⁶ found that in the cleft area, most developmental dental irregularities are related to the maxillary lateral incisors in both deciduous and permanent dentition. Dental anomalies may be a complicating factor in dental as well as orthodontic treatment planning, hence a detailed examination to determine the existence of anomalies is required before the initiation of orthodontic correction. This is especially true with regard to orthodontic treatment that involves extractions, which relies on healthy remaining teeth and roots to accommodate force application.

Table I Sample distribution according to gender

Sex	N (%)	Age (y) Mean ± SD
Male	65 (65%)	14.67 ± 5.11
Female	35 (35%)	12.57 ± 2.83

Table III Prevalence of missing teeth according to gender

Cleft Type	Sex	Missing teeth		Total	P value
		No	Yes		
BCLP	Male	5 (22.7%)	17 (77.3%)	22	0.140 ^{ns}
	Female	-	8 (100%)	8	
UCLP	Male	10 (25.5%)	33 (76.7%)	43	0.590 ^{ns}
	Female	4 (14.5%)	23 (65.2%)	27	

Table V Prevalence of supernumerary teeth according to gender

Cleft Type	Sex	SUPERNUMERARY TEETH		Total
		No	Yes	
BCLP	Male	20(90%)	2(10%)	22
	Female	7(87.5%)	1(12.5%)	8
UCLP	Male	3(90%)	1(14%)	4
	Female	26(96.2%)	1(3.7%)	27

Table VII Prevalence of impacted teeth according gender

CLEFT TYPE	IMPACTED TEETH - SIDE INVOLVED				TOTAL
	NONE	IPSILATERAL	CONTRALATERAL	BOTH	
BCLP	25(35.7%)	3(10%)	-	2(5.8%)	30
UCLP	52(74.28%)	13(18.57%)	3(4.28%)	2(2.85%)	70
Total	77	16	3	4	100

AIM AND OBJECTIVES

The purpose of the following study is to investigate the frequency of various dental anomalies in patients with unilateral and bilateral cleft lip and palate, both inside and outside the cleft region, and the possible association between the side of the cleft and the side of the dental anomalies.

MATERIALS AND METHOD

The sample consisted of 100 consecutive patients of repaired cleft lip and palate with the age group ranging from 8 to 25 years. The subject distribution according to gender and mean age is described in Table I. The patients were divided into 2 groups, patients with bilateral and unilateral complete cleft lip and palate as mentioned in Table II.

Lateral cephalograms, OPGs, photos and dental casts were

Table II Sample distribution according to cleft type

Sex	Cleft Type		Total
	BILATERAL	UNILATERAL	
Male	22 (33.2%)	43 (66.2%)	65
Female	8 (22.9%)	27 (77.1%)	35
Total	30	70	100

Table IV Prevalence of missing teeth according to side involved

CLEFT TYPE	MISSING TEETH- SIDE INVOLVED				TOTAL
	NONE	IPSILATERAL	CONTRALATERAL	BOTH	
BCLP	5 (18.7%)	-	-	25 (81.3%)	30
UCLP	14 (20%)	24 (34.3%)	7 (10%)	25 (35.7%)	70
Total	19	24	7	50	100

Table VI Prevalence of supernumerary teeth according to side involved

CLEFT TYPE	SUPERNUMERARY TEETH - SIDE INVOLVED				TOTAL
	NONE	IPSILATERAL	CONTRALATERAL	BOTH	
BCLP	27(90%)	-	-	2(10%)	30
UCLP	65(90%)	3(4.23%)	2(2.85%)	2(2.85%)	70
Total	92	3	2	4	100

Table VIII Prevalence of impacted teeth according to side involved

CLEFT TYPE	IMPACTED TEETH- SIDE INVOLVED				TOTAL
	NONE	IPSILATERAL	CONTRALATERAL	BOTH	
BCLP	25(83.3%)	3(10%)	-	2(6.6%)	30
UCLP	52(74.28%)	13(18.57%)	3(4.28%)	2(2.85%)	70
Total	77	16	3	4	100

used for the observation purposes. Panoramic, periapical and occlusal radiographs were used to determine the presence or absence of teeth. All the radiographs were of diagnostic clarity. Subjects who were a part of the study did not have clefts as a part of a craniofacial syndrome.

The following anomalies were investigated:

1. Missing/Agenesis: Congenital absence of a permanent tooth or germ.
2. Supernumerary teeth: Those that appear in addition to the regular number of teeth.
3. Impaction: A tooth that is not expected to erupt completely into its normal functional position based on clinical and radiographic assessment (Thilander and Jakobsson, 1968).⁷

STATISTICAL ANALYSIS

A single observer analyzed the dental casts, photographs and radiographs. Student t test and Chi Square test were done to determine the comparisons between cleft and non-cleft side data for both males and females. Statistical significance was set at $p < 0.05$.

RESULTS

Results showed that missing teeth were found in 81% of the cleft patients with a higher predilection in males (61.7%) compared to females (Table III). A significantly higher number of missing teeth were seen in the cleft side of ULCP patients (34.3% showed involvement on ipsilateral side, 10% on contralateral side and 35.7% involving both sides) as depicted in Table IV and on both the sides in BCLP patients (83.3%). These values were statistically significant with p value < 0.001 .

Supernumerary teeth were seen in only 10% patients, more commonly in UCLP patients with a higher incidence in males (6%) as shown in Table V. Among the BCLP patients, 10% cases showed prevalence of supernumerary teeth with involvement on both the sides. In ULCP patients, 4.3% showed involvement on ipsilateral side followed by 2.85% on contralateral side and 2.85% involving both sides (Table VI).

Impacted teeth were observed in 23% of the patients with a higher prevalence of 56.5% in UCLP female patients (Table VII). Among the BCLP patients, 10% cases showed involvement on one side whereas 6.7% showed involvement on both the sides. In ULCP patients, 18.6% showed involvement on ipsilateral side, 4.3% on contralateral side and 2.9% involving both sides (Table VIII).

DISCUSSION

Study of the most common patterns of dental anomalies (shape, number and location) in subjects with complete unilateral cleft lip and palate, either in the cleft area (involving the permanent lateral incisor) or outside it, is important for accurate, timely and effective orthodontic treatment planning. Also, the prevalence of dental anomalies has been found to vary among different racial/ethnic groups. The rate of overall dental anomalies has generally been found to be higher among cleft patients in comparison with the general population, with anomalies most often located in the area of the cleft (Ribeiro et al., 2003)⁹. This corresponds with the findings of the present study where a significant portion of individuals with cleft (89%) found to have at least one dental anomaly. In this present study, the prevalence of hypodontia was found to be 81% in cleft patients, which coincides with the findings of Shapira et al (77%)⁶. Ranta reported that the prevalence of hypodontia increases

strongly with the severity of clefts, which was in accordance to the present study which indicated that the number of subjects suffering from hypodontia was highest in bilateral CLP subjects⁹. No significant difference was found in prevalence of hypodontia between the sexes. 76.9 % of male subjects and 88.6 % female subjects suffered from hypodontia. These numbers are significantly greater than the findings of Shapira et al⁶ who reported the incidence of hypodontia at 46% in boys and 31% in girls. Also, maxillary lateral incisor was the most prevalent missing tooth followed by the maxillary second pre molars.

Supernumerary teeth were found in 10% of the subjects; which is almost double the 5.4% in the study of Kim et al². Also, supernumerary teeth occurred in the maxilla, corresponding to the findings of Kraus et al¹⁰, who proposed that it occurred more frequently in maxillary lateral incisor region adjacent to the cleft followed by maxillary second pre molars.

Analysis of impacted teeth of the subjects showed that the highest prevalence was in the maxillary arch of both unilateral and bilateral CLP subjects, mostly affecting maxillary canines. The varying results reported in the literature can be explained by the application of different criteria in different studies and a lack of standardization of the data. However, a much greater sample size would be necessary to draw more precise conclusions.

CONCLUSION

The most common dental anomaly in the cleft lip and palate patient is that of missing tooth, the most common being maxillary lateral incisor followed by maxillary second pre molar. Both supernumerary and impacted teeth occur mostly in the maxillary arch with the maxillary canines as the most frequently affected teeth in both types of clefts. No sex differences were found in regard to the prevalence of missing, impacted or supernumerary teeth. Missing, impacted as well as supernumerary teeth were significantly higher in the cleft side of unilateral cleft lip and palate patients. In bilateral cleft lip and palate patients missing and supernumerary teeth were higher on both sides of the defect whereas impacted occurred only on one side of the defect. The management of dental anomalies, which can easily be detected by careful inspection of routine orthodontic diagnostic records, should be taken into consideration in treatment planning of individuals with a cleft.

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